CLAIMS

1. Use of γ-glutamyl-peptide in the preparation of a medicament or nutritional formulation for humans or animals for the treatment, testing for or prophylaxis of a disease or condition which is characterized by increased bone resorption.

2. Method of administering to a human or animal who can benefit from an effective amount of γ-glutamyl-peptide.

3. The method as claimed in claim 2 wherein the human or animal is in need of γ-glutamyl-peptide.

4. The method as claimed in claims 2 and 3 wherein bone resorption is inhibited.

5. Method of treating, testing for or preventing a disease or condition which is characterized by increased bone resorption comprising administering to a human or animal in need thereof an effective amount of γ-glutamyl-peptide.

6. Use of γ-glutamyl-peptide in the dietary management of increased bone resorption.

7. The use or method of any preceding claim wherein the γ-glutamyl-petide is γ-glutamyl-alkyl-cysteine sulfoxide or γ-glutamy-alkenyl-cysteine sulfoxide, or any combination thereof.

8. The use or method of claim 7 wherein the γ-glutamyl-alkenyl-cysteine sulfoxide is γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide.

9. The use or method of any one of claims 1, 3, 4, 5, 7 or 8 wherein the disease or condition which is characterized by increased bone resorption, is Paget's disease, tumor-induced bone disease or osteoporosis or any combination thereof.

10. A nutritional composition comprising γ-glutamyl-peptide and a nutritionally acceptable carrier.

11. The nutritional composition of claim 10 wherein the γ-glutamyl-petide is γ-glutamyl-alkyl-cysteine sulfoxide or γ-glutamy-alkenyl-cysteine sulfoxide or a combination thereof.

12. The nutritional composition of claim 11 wherein the γ-glutamyl-alkenyl-cysteine sulfoxide is γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide.

13. The nutritional composition of any one of claims 10 to 12 further comprising
(a) a calcium source,
(b) at least one energy source selected from the group consisting of carbohydrate, fat and nitrogen sources, and optionally
(c) Vitamin D.

14. The nutritional composition of claim 13, wherein the calcium source (a) is an organic calcium salt.

15. The nutritional composition of claim 13 or 14, wherein the carbohydrate source of component (b) is selected from the group consisting of maltodextrins, starch, lactose, glucose, sucrose, fructose, xylit, sorbit, and mixtures thereof.

16. The nutritional composition of any one of claims 13 to 15, wherein the fat source of component (b) is selected from the group consisting of omega-6 polyunsaturated fatty acid sources, omega-3 polyunsaturated fatty acid sources, mono-unsaturated fatty acid sources, C_6-C_{12}- fatty acid sources, and mixtures thereof.

17. The nutritional composition of any one of claims 13 to 16, wherein the nitrogen source of component (b) is selected from the group consisting of soy bean derived proteins; milk proteins, protein hydrolysates, a mixture of essential amino acids and arginine, and mixtures thereof.

18. The nutritional composition of any one of claims 13 to 17, wherein the carbohydrate source provides for 30 to 70 %, the nitrogen source for 5 to 40 %, and the fat source for 0.01 to 5 % of the total energy supply of the composition.

19. The nutritional composition of any one of claims 13 to 18 comprising from 3 to 25 % by weight of component (a), from 5 to 50 % by weight of component (b) and from 1 to 95 % by weight of component (c), based on the total weight of the nutritional composition.

20. The nutritional composition of any one of claims 10 to 19 further comprising 0.2 to 10 % by weight of other nutritionally acceptable components chosen from vitamins, minerals, trace elements, fibers, flavors, preservatives, colorants, sweeteners and emulsifiers.

21. The nutritional composition of any one of claims 10 to 20 in the form of a dietary supplement providing from 50 to 1500 kcal/day, or in the form of an animal feed supplement.

22. The nutritional composition of any one of claims 10 to 21 in liquid form.

23. The nutritional composition of any one of claims 10 to 21 in granulate or powder form.

24. A pharmaceutical composition in single unit dose form, comprising γ-glutamyl-peptide and a pharmaceutically acceptable carrier.

25. The pharmaceutical composition of claim 24 wherein the γ-glutamyl-petide is γ-glutamyl-alkyl-cysteine sulfoxide or γ-glutamy-alkenyl-cysteine sulfoxide or a combination thereof.

26. The pharmaceutical composition of claim 25 wherein the γ-glutamyl-alkenyl-cysteine sulfoxide is γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide.

27. The pharmaceutical composition of any one of claims 24 to 26 for enteral administration in the form of a dragée, tablet, capsule, sachet or suppository.

28. The pharmaceutical composition of any one of claims 24 to 27 in the form of a veterinary composition.

29. γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide obtained by fractionation of an hydrophilic, ethanolic extract of Allium, which fractionation comprises

(a) obtaining an hydrophilic, ethanolic extract of Allium cepa, hereinafter referred to as fraction A, by using adsorption column chromatography,

(b) separating saccharides from fraction A by using reversed-phase medium pressure liquid chromatography (RP-MPLC) to obtain fraction A1

(c) further separating saccharides from fraction A1 by NP-MPLC using chloroform – methanol – water 6.4:5:1 as mobile phase, to obtain fraction A1-4,

(d) further fractionation by semi-preparative reversed-phase HPLC (SP-RP-HPLC) using as solvent an isocratic water/acetonitrile system buffered with e.g. 0.00625% formic acid to obtain fraction A1-4C.

30. The γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide of claim 29 wherein said Allium comprises Allium cepa, Allium ascalonicum , Allium ampeloprasum , Allium porrum , Allium schoenoprasum , Allium ursinum , Allium sativum or Allium fistulosum .

31. The γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide of claim 30 wherein said allium comprises Allium ascalonicum , Allium porrum , Allium cepa Allium ursinum .

32. The γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide of claim 31 wherein said allium comprises allium cepa.

33. Process for producing a veterinary composition for the treatment or prophylaxis of a disease or condition in animal which is characterized by increased bone resorption or for the management of increased bone resorption in animal comprising homogenizing a mixture of one or more carriers that are physiologically acceptable to animals and an effective amount of a γ-glutamyl-peptide.

34. The process of claim 30 wherein the γ-glutamyl-petide is γ-glutamyl-alkyl-cysteine sulfoxide or γ-glutamy-alkenyl-cysteine sulfoxide or a combination thereof.

35. The process of claim 34 wherein the γ-glutamyl-alkenyl-cysteine sulfoxide is γ-L-glutamyl-trans-S-1-propenyl-L-cysteine sulfoxide.

36. The use or method as claimed in claims 1-9 wherein γ-glutamyl-peptide inhibits dose-dependently the resorption activity of osteoclasts

37. The use or method as claimed in claims 1-9 wherein the minimal effective dose is about 2 mM.

38. The nutritional or pharmaceutical composition as claimed in claims 10-28 wherein γ-glutamyl-peptide inhibits dose-dependently the resorption activity of osteoclasts

39. The nutritional or pharmaceutical composition as claimed in claims 10-28 wherein the minimal effective dose is about 2 mM.

40. The nutritional or pharmaceutical composition as claimed in claims 10-28 wherein the dose is at least 2 mM.